



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

August 18, 1999

MEMORANDUM

SUBJECT: Acephate. List B Reregistration Case No. 0042/Chemical ID No. 103301.
Acute Anticipated Residues Assessment for the HED RED. No MRID #. DP
Barcode No. D259659.

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Anticipated residues were generated for the chemical acephate for use in an acute Monte Carlo probabilistic assessment. Chronic and Carcinogenic Anticipated residues were previously generated in 1998. A Tier 1 acute dietary exposure assessment using worst case estimates, i.e. tolerance level residues and no percent crop treated data, was previously conducted and is summarized in a memo dated 10/30/98, (F. Fort). Acephate [O,S-dimethyl acetylphosphoramidothioate] is a systemic/contact organophosphate insecticide and is currently registered for food/feed uses on a variety of field, fruit, and vegetable crops as well as in food-handling establishments for the control of insect pests. The granular (G) and soluble concentrate (SC/L) are the acephate formulation classes registered for use on these sites. These formulations are typically applied to food/feed crops as foliar, soil, and/or seed treatments using ground or aerial equipment and in food-handling establishments as spot or crack-and-crevice treatments. Food-handling establishment uses are not included in acute exposure assessments (see memorandum titled "Final Office Policy for Performing Acute Dietary Exposure Assessments", D. Edwards, 6/13/96).

Acephate was the subject of a Reregistration Standard Guidance Document dated 9/87; the Residue Chemistry Science Chapter of the Guidance Document was dated 1/28/82. Subsequent addenda to the Acephate Reregistration Standard were issued 3/9/82, 4/4/82, 10/5/84, and 9/23/85. The Acephate Residue Chemistry Reregistration Standard Update was completed 8/8/91.

The nature of the residue is adequately understood. The residues of concern are the parent, acephate per se, and its cholinesterase inhibiting metabolite, methamidophos. Tolerances have been established for the combined residues of acephate and its cholinesterase-inhibiting metabolite methamidophos in/on various raw agricultural and processed plant and animal commodities. The established tolerances ranged from 0.02 ppm for residues in food items as a result of use of acephate in food-handling establishments to 15 ppm for residues in grass forage and hay and mint hay [40 CFR §180.108(a) and (b), §185.100, and §186.100]. Tolerances for residues in several commodities (beans, Brussels sprouts, cauliflower, celery, cranberries, lettuce, mint hay, and peppers) include limits on residues of methamidophos. Adequate methods are available to enforce the established tolerances. The Pesticide Analytical Manual (PAM) Volume II lists Methods I and II, GLC methods employing thermionic detection, as well as Method A, a confirmatory TLC method.

The available storage stability data indicate that the combined residues of acephate and methamidophos are stable under frozen storage conditions (-20 C) in/on the following commodities (storage interval in parentheses): eggs (~6 months); milk (~7 months); kidney, cow (~6 months); muscle, cow (~7 months); beans, pinto (~15 months); beans, snap (~15 months); Brussels sprouts (~9 months); celery (~12 months); cottonseed (~10 months); grass, Bermuda, forage and hay (~2 months); grass, pasture, forage (~9 months); lettuce (~17 months); peas, pigeon (~14 months); peppers, bell (~13 months); rice grain and straw (~17 months); peanut (~14 months) peanut oil (~4 months); green tobacco (~14 months); soybean oil (~15 months); corn meal (~15 months) and spearmint, fresh and spent hay (~2 months). The overall storage stability database supports reregistration eligibility for products containing the active ingredient, acephate.

Conclusions/Recommendation

The following table summarizes anticipated residues to be used in the acute dietary analysis for acephate and include anticipated residues for methamidophos from acephate uses. Refer to the detailed considerations for the derivation of individual numbers. All documents used to generate the anticipated residues were cited in the bibliography of the Chemistry chapter of the HED RED. The table below includes BEAD percent crop treated data (A. Halvorson, 12/12/97) for acephate. The usage data were primarily from the years 1987 through 1996. The source of these data were USDA, Research Triangle Institute, the National Center for Food and Agricultural Policy, and proprietary data. These data will be incorporated in the dietary exposure assessment along with the anticipated residue data.

Table 1. Summary of Anticipated Residues for Acute Monte Carlo Assessment

Commodity/ Food Form	Blended (B) Partially Blended (PB) Not Blended (NB)	Established Tolerance Acephate (methamidophos) ppm	Reassessed Tolerance Acephate (methamidophos) ppm	Est. Max % CT	Data Source PDP/FDA/FT	Anticipated Residue or Residue Data File Acephate	Anticipated Residue or Residue Data File Methamidophos
Succulent Beans (all food forms)	PB	3 (1)	3 (1)	39/47 fresh/ proc.	PDP	Use directly - RDF 736NZ, 1451Z, 191 ½LOD (Fresh) 736NZ, 1260Z, 382 ½LOD (Processed)	Use directly - RDF 714NZ, 1457Z, 217 ½LOD (Fresh) 714NZ, 1266Z, 408 ½LOD (Processed)
Dry Beans (all food forms)	B	3(1)	3(1)	5	FT	AR = 0.005 x 0.05 (%CT) = 0.00025ppm	AR = 0.005 x 0.05 (%CT) = 0.00025ppm
Brussels sprouts (all food forms)	PB	3 (0.5)	3(1)	21 ^a	FT	RDF = 38Z, 10NZ	RDF = 23 Z, 6 NZ
Cauliflower (all Food Forms except frozen:cooked)	NB	2 (0.5)	2 (1)	21	FDA	RDF = 3 detects, 168Z, 42 ½ LOD	RDF = 6 detects, 169Z, 39 ½ LOD
Cauliflower (frozen:cooked)	PB					RDF = 3 detects, 168Z, 42 ½ LOD	RDF = 6 detects, 169Z, 39 ½ LOD
Celery (all food forms except canned, frozen, and celery juice)	NB	10(1)	10(1)	68	PDP	Decomposite 1000NZ 780Z 659 @ 1/2LOD	Decomposite 1000NZ 1231Z 1615 @ 1/2LOD
Celery (canned, frozen, juice)	PB					Use directly-RDF 73NZ, 56Z, 47 ½LOD	Use directly-RDF 45NZ, 56Z, 75 ½LOD
Cottonseed meal	B	8	1	13	FT	AR = 0.07x (Processing Factor = 1.41) x 13%CT =0.013	AR = 0.02x (Processing Factor=1.00) x 13%CT=0.0026

Commodity/ Food Form	Blended (B) Partially Blended (PB) Not Blended (NB)	Established Tolerance Acephate (methamidophos) ppm	Reassessed Tolerance Acephate (methamidophos) ppm	Est. Max % CT	Data Source PDP/FDA/FT	Anticipated Residue or Residue Data File Acephate	Anticipated Residue or Residue Data File Methamidophos
Cottonseed (oil)	B	2(0.1)	0.5(0.1)	13	FT	AR = 0.07x (Processing Factor = 0.20) x 13%CT =0.0018	AR = 0.02x (Processing Factor=1.00) x 13%CT=0.0026
Cranberries	PB	0.5 (0.1)	0.5 (0.1)	51	FT	RDF = 7Z, 7NZ	RDF = 51 @0.005, 49Z
Cranberry juice	PB				FT	RDF = 7Z, 7NZ (Deem Default Processing Factor)	RDF = 51 @0.005, 49Z (Deem Default Processing Factor)
Head Lettuce	NB	10(1)	10(1)	63	PDP	Decomposite 1000NZ 2846Z 3846@1/2LOD	Decomposite 1000NZ 6167Z 9499@1/2LOD
Macadamia Nuts	PB	0.05	0.05	1	FT	RDF = 1@0.01 99@0	RDF = 1@0.01 99@0
Mint	B	15(1)	27(2)	42	FT	AR = 6.7 ppm x 0.42 (%CT) = 2.8	AR = 0.5 X 0.42 (%CT) = 0.21
Mint oil	B				FT	AR = 0.01 X 0.42 (%CT) = 0.0042	AR = 0.01 ppm X 0.42(%CT) = 0.0042
Peanut (all food forms)	B	0.2	0.2	10	FT	AR = 0.01 X .10 (%CT) = 0.001	AR =0.01 X .10 (%CT) = 0.001
Peanut Processed Commodities	B					AR = 0.01 X .10 (%CT) = 0.001 x processing factor	AR =0.01 X .10 (%CT) = 0.001 x processing factor
Pepper Bell,(all food forms except canned, frozen and cured	NB	4(1)	4(1)	48	FDA(Acep. FT (Meth.)	Decomposite 1000NZ 4727Z 3364@1/2LOD	RDF = 8NZ, 9Z

Commodity/ Food Form	Blended (B) Partially Blended (PB) Not Blended (NB)	Established Tolerance Acephate (methamidophos) ppm	Reassessed Tolerance Acephate (methamidophos) ppm	Est. Max % CT	Data Source PDP/FDA/FT	Anticipated Residue or Residue Data File Acephate	Anticipated Residue or Residue Data File Methamidophos
Peppers ,Bell (canned, frozen, cured)	PB	4(1)	4(1)	48	FDA(Acep. FT (Meth	RDF = 174NZ, 841Z, 602 @ 1/2LOD	RDF = 8NZ, 9Z
Pepper, Non Bell (all food forms except canned, frozen and cured)	NB	4(1)	4(1)	48 ^b	FDA(Acep.) FT (Meth.)	Decomposite 1000NZ 5778Z 4333 @ 1/2LOD	RDF = 4NZ, 4Z
Peppers, Non-Bell (canned, frozen and cured)	PB	4(1)	4(1)	48 ^b	FDA(Acep. FT (Meth	RDF=141NZ, 836Z, 631 @ 1/2LOD	RDF = 4NZ, 4Z
Soybean	B	1	1	0.2	FT	AR = 0.055 X .01 (%CT) = 0.00055	AR = 0.008 X .01 (%CT) = 0.00008
Soybean processed commodities	B	4	1	0.2	FT	0.00055 x (processing factor) See Table 19 for factors	0.00008 x (processing factor). See Table 19 for factors
a. Percent crop treated translated from cauliflower							
b. Percent crop treated translated from bell peppers							

Table 2. Meat, Milk, Poultry and Eggs Anticipated Residues

Tissue	Acute Anticipated Residue
Ruminant muscle	0.00002
Ruminant fat	0.000016
Ruminant liver	0.000006
Ruminant kidney	0.000050
Poultry Muscle	0.000012
Poultry Fat	0.000001
Poultry liver	0.000001
Poultry kidney	0.0000002
Egg	0.000026
Milk*	0.0005

*Residue distribution file will be created which includes adjustment for percent crop treated for cotton (13%CT)

DETAILED CONSIDERATIONS

A Tier 3 probabilistic Monte Carlo assessment will be conducted using a new technique for incorporating PDP and FDA monitoring results into an acute risk assessment. This has been difficult in the past because PDP testing has been performed using composited samples, while acute risk assessments must have information about the residues in individual units of produce. The new technique, developed by Hans Allender (Allender, H. “Use of the Pesticide Data Program (PDP) technique in Acute Dietary Assessment,” August 1998), mathematically converts results from composited samples into results representative of the individual servings, and is described below.

For purposes of acute risk assessment, all foods and food forms have been divided into three categories, currently called “blended,” “partially blended” and “not blended”. The statistical method is applied only to food forms that are “not blended”. “Not blended” foods are larger than the size of a plum, so that consumption of an individual unit of produce can constitute a single acute dietary exposure. An individual unit of produce may be assumed to have been uniformly treated with a pesticide, but two such units may be usefully applied to “not blended” commodities. It is these “not blended” foods that are decomposed by the Allender method. Head lettuce is an example of “not blended” food.

“Blended” commodities are grain seed and other very small units of produce that can produce a single acute exposure only when large numbers are consumed. These foods are also blended across a wide geographic area so that the BEAD estimate of the maximum percent crop treated cannot be used to infer whether an individual PDP sample has been treated. Liquids may be considered blended when they meet this latter stipulation. Soybeans and dry beans are foods which are considered to be “blended” foods in this assessment.

“Partially blended” foods consist of units of produce that are smaller than a plum, so that more than one

unit of food would usually be involved in an acute dietary exposure incident, however, “partially blended” foods are only blended locally (not over a wide area) so that BEAD estimates can be used to infer the proportion of the samples that have been treated with the pesticide. Macadamia nut and cranberries are examples of foods which are considered to be “partially blended” in this assessment.

This assessment includes data from residue field trials, Food and Drug Administration (FDA) monitoring data and USDA Pesticide Data Program monitoring data. In determining which data will be utilized, HED will use a preferential order, PDP>FDA>Field trial data.

Anticipated Residues Derived from Monitoring Data

Adequate Pesticide Data Program (PDP) and FDA monitoring data are available for the commodities succulent beans, cauliflower, celery, head lettuce, and peppers (bell and non-bell). A weighted average of the limits of detection will be used in the assessment for all treated non-detects. BEAD provided percent crop treated data will be incorporated into the anticipated residue or residue distribution file when appropriate. Monitoring data from the years 1994 through 1997 (PDP) and the years 1993 through 1998 (FDA) were considered. These data are summarized below.

Succulent Beans

Partially Blended

Table 3

Acephate						
PDP			% detect	Range of detects (ppm)	RDF files	
					fresh	processed
1994	591 samples	132 detects	31 %	0.003-2.8 (1V ¹ @ 3.3)	39 % CT	47% CT
1995	587 samples	120 detects			736 detects	736 detects
1996	531 samples	178 detects			1451, 0	1260, 0
<u>1997</u>	<u>669 samples</u>	<u>306 detects</u>			191, ½LOD	382, ½ LOD
2378 samples 736 detects						
Methamidophos						
1994	591 samples	127 detects	30 %	0.002 - 0.66 (1V ¹ @ 2.0)	39 % CT	47% CT
1995	587 samples	112 detects			714 detects	714 detects
1996	531 samples	171 detects			1457, 0	1266, 0
<u>1997</u>	<u>679 samples</u>	<u>304 detects</u>			217, ½ LOD	408, ½ LOD
2388 samples 714 detects						

1. V = Violative sample(s); not used in dietary assessment

Cauliflower

Not Blended

Table 4

Acephate			
FDA	% detects	Range of detects (ppm)	RDF File
1993 57 samples 0 detects 1994 51 samples 1 detect 1995 29 samples 0 detects 1996 31 samples 0 detects 1997 20 samples 1 detect 1998 <u>25 samples 1 detect</u> 213 samples 3 detects	1%	0.01 - 0.143	Data used directly 21% CT 3 detects 168, 0 42, ½ LOD
Methamidophos			
1993 58 samples 1 detect 1994 51 samples 1 detect 1995 29 samples 0 detects 1996 31 samples 2 detects 1997 20 samples 1 detect 1998 <u>25 samples 1 detect</u> 214 samples 6 detects	3%	0.003 - 0.12	Data Used directly 21% CT 6 Detects 169, 0 39, ½ LOD

Celery

Not Blended except canned and frozen celery and celery juice which are considered partially blended.

Table 5

Acephate				
PDP ^a	% detect	Range of detects (ppm)	RDF file	
			not blended	partially blended
1994 176 samples 73 detects ^b	41%	0.005 - 1.3	Decomposite 1000NZ 780Z 659 @ 1/2 LOD	Data used directly 68% CT 73 detects 56, 0 47, ½ LOD
Methamidophos				
1994 176 samples 45 detects ^b	26%	0.004 - 0.082	Decomposite 1000NZ 1231Z 1615@ 1/2LOD	Data used directly 68% CT 45 detects 56, 0 75, ½ LOD

a. Decomposition method will be applied to all food forms except canned and frozen celery and celery juice which are considered partially blended.

b. FDA data from 1993 - 1998 supports the limited PDP data.

Head Lettuce

Not Blended

Table 6

Acephate			
PDP ^a	% detect	Range of detects (ppm)	RDF file ^b
1994 691 samples 88 detects	13%	0.005-0.25	Decomposite 63% CT 1000NZ 2846Z 3846 @1/2LOD
Methamidophos			
1994 691 samples 41 detects ^b	6%	0.004-0.042	Decomposite 63% CT 1000NZ 6167Z 9499 @1/2LOD

a. FDA data from 1993 - 1998 supports the limited PDP data.

b. Decomposition method will be applied

Non-bell peppers

Not blended except canned, frozen and cured which are considered partially blended

Table 7

Acephate				
FDA	% detects	Range of detects (ppm)	RDF File	
			Not Blended	Partially Blended
1993 337 samples 38 detects 1994 250 samples 13 detect 1995 272 samples 10 detects 1996 283 samples 39 detects 1997 239 samples 16 detect 1998 <u>237 samples 25 detect</u> 1608 samples 141 detects	9%	0.007-3.4 (1V ¹ @ 5.3)	Decomposite 1000NZ 5778Z 4333 @1/2LOD	48% CT 141 detects 836, 0 631, ½ LOD
Methamidophos				
Use Field Trial Data	33%		Use Field Trial Data (see below)	Use Field Trial Data (see below)

1. V = Violative sample(s); not used in risk assessment

Bell peppers

Not blended except canned, frozen, and cured food forms which are considered partially blended

Table 8

Acephate

FDA	% detects	Range of detects	RDF	
			Not Blended	Partially Blended
1993 239 samples 29 detects ^b 1994 256 samples 29 detects 1995 334 samples 32detects 1996 320 samples 46 detects 1997 281 samples 26 detects 1998 187 samples 12 detects 1617 samples 174 detects	11%	0.005 - 3.14 (1V ¹ @ 4.3)	Decomposite 1000NZ 4727Z 3364 @ 1/2LOD	48% CT 174 detects 841, 0 602, ½ LOD
Methamidophos				
Use Field Trial Data	21%		Use Field Trial Data (see below)	Use Field Trial Data (see below)

Anticipated Residues Derived from Field Trials

Dry Beans

Blended

One field trial in CA was conducted during 1987. Six foliar applications of Orthene 75S (1.0 lb acephate a.i./A) were made using a backpack boom sprayer. Bean vines were cut 14 days after the final treatment and were allowed to field dry for 10 days before being hand threshed. No acephate residues were found in the dry shelled beans. Additionally, no detectable residues were found in five years of FDA data (1992-96). The LOD of both the field trial and FDA method was determined to be 0.01 ppm.

Because no detectable residues were found in any of the treated samples, the anticipated residue will be ½ the limit of detection of the collection method multiplied by the BEAD estimate of percent crop treated for dry beans of 5%. **Therefore the anticipated residue for dry beans will be 0.00025 ppm for both acephate and methamidophos.**

Brussels Sprouts

Partially Blended

Use patterns registered to Valent U.S.A. Corporation: The 75% SC/S (EPA Reg. No. 59639-26 and 59639-89) formulations of acephate are registered for use on Brussels sprouts for multiple foliar applications at 1.0 lb ai/A/application using ground or aerial equipment. A 14-day PHI has been established. A maximum seasonal application of 6 lbs ai/A is specified on the product labels; however, the registrant has stated its intention to amend the labels to a maximum of 2 lbs ai/A. None of the available data reflect the intended label changes; therefore the anticipated residue for Brussels sprouts are likely conservative.

Acephate

Table 9. Residues of acephate in/on Brussels sprouts harvested at a posttreatment interval of 14 days following the last of multiple foliar applications of a 75% SC/S formulation at 1.0 lb ai/A/application.

MRID No. 4140010-15			
No. Of Applications	PHI	ppm of Acephate found	RDF file 21% CT
5	14	0.08, 0.23	38, 0 0.08 0.23 0.63 1.0
6	14	0.63, 1.0, 2.1, 1.6	2.1 1.6 1.3
8	14	1.3, 1.4, 0.97, 0.45	1.4 0.97 0.45

% CT translated from cauliflower

Methamidophos

Table 10. Residues of acephate in/on Brussels sprouts harvested at a posttreatment interval of 14 days following the last of multiple foliar applications of a 75% SC/S formulation at 1.0 lb ai/A/application.

No. Of Applications	PHI	ppm of Methamidophos found	RDF file 21%CT
8	14	0.06 0.08	23, 0 0.06 0.08
8	14	0.06 0.04	0.06 0.04 0.01
5	14	0.01 0.02	0.02

Cotton

Blended

There are several acephate products registered for use on cotton. These formulations may be applied preplant, at-planting, and postemergence (foliarly) at up to 1.0 lb ai/A/application. No maximum seasonal rate is specified on the label. The registrant in a use closure memo dated 12/23/97 stated its intentions to modify the labels to specify a maximum seasonal rate of 6.0 lbs ai/A/crop cycle. A PHI of 21 days is established.

The anticipated residue will be adjusted to account for percent crop treated and processing factors for cottonseed oil and meal.

Acephate

Table 11. Residues of acephate in/on cottonseed harvested at a posttreatment interval of 90 days following multiple foliar applications at 1.0 lb ai/A/application.		
No. Of Applications	PHI	ppm of acephate Found
5	21	0.23, 0.31, 0.03, 0.03, 0.05, 0.05,
6	17	0.03, 0.03, 0.03, 0.03, 0.11, 0.06, <0.02, <0.02, 0.07, 0.08, 0.06, 0.05, 0.22, 0.20, <0.02, <0.02, 0.07, 0.04, 0.05, 0.05, 0.23, 0.18,
6	21	<0.02, <0.02,
7	25	<0.02, <0.02,
Anticipated Residue = 0.07		

Methamidophos

Table 12. Residues of methamidophos in/on cottonseed harvested at a posttreatment interval of 90 days following multiple foliar applications at 1.0 lb ai/A/application.		
No. Of Applications	PHI	ppm of methamidophos Found
9	21	0.01, 0.01, <0.01, <0.01, <0.01, <0.01
8	20-21	<0.01, <0.01, <0.01, <0.01
5	21	0.03, 0.05, 0.05, 0.05, 0.04, 0.04, 0.03, 0.04
Anticipated Residue = 0.02		

Cranberries

Partially Blended

The 75% SC/S formulation of acephate is registered for use on cranberries for up to two foliar applications at 1.0 lb ai/A/application using ground or aerial equipment. A 75 day PHI has been established.

Acephate

Table 13. Residues of acephate in/on cranberry harvested following one or two foliar applications of a 75% SC/S formulation at 1.0 lb ai/A/application.

No. Of Applications	PHI	ppm of Acephate found	RDF file 51% CT
2	88 days	0.07, 0.05	7, 0 0.07 0.05 0.11 0.13 0.12 0.18 0.18

2	66	0.11, 0.13, 0.12	
1	83	0.18, 0.18	

Methamidophos

No detectable residues of methamidophos are found in both the field trial studies and FDA monitoring. Because no detectable residues were found in any of the treated samples, the anticipated residue will be ½ the limit of detection (0.01 ppm) of the collection method. **The percent crop treated is reported as 51%; therefore, a RDF which consists of 51 residues at 0.005 and 49 zeroes will be created.**

Macadamia Nuts

Partially blended

Adequate residue data were submitted in support of uses of acephate in/on macadamia nuts (ACC #00138156). No detectable residues of acephate or methamidophos were found in 21 samples of macadamia nuts (LOD = <0.02 ppm); therefore, 0.01 ppm (1/2LOD) will be used as the anticipated residue for macadamia nuts. **The percent crop treated is reported as 1% ; therefore, a RDF will be created which consists of 1 residue at 0.01 and 99 zeroes.**

Mint

Blended

Adequate residue data were submitted in support of uses of acephate on mint. These data were reviewed by HED in a memo dated 4/10/97 (F. Fort), and additional data were summarized in the dietary exposure assessment review dated 1/28/89 (F.Suhre).

No detectable residues were found in mint oil (LOD = <0.02 ppm) in any samples (8); therefore, 0.01 ppm (1/2LOD) adjusted for 42 % crop treated will be used as the anticipated residue for mint oil (0.0042 ppm).

Use patterns registered to Valent: The 75% SC formulations (EPA Reg. Nos. 59639-26 and 59639-89, and EPA SLN No. OR890015) are registered for two foliar applications to mint (peppermint and spearmint) at 1.0 lb ai/A/application using ground or aerial equipment. Applications should be made in a minimum of 20 gal/A of water when using ground equipment, and 5 gal/A of water when using aerial equipment. The established PHI is 14 days and the maximum seasonal rate is 2.0 lb ai/A. The use of spent mint hay (hay after oil is extracted) for feed for dairy animals is prohibited.

The anticipated for mint will be adjusted by the percent crop treated of 42%.

Acephate

Table 14. Residues of methamidophos in/on mint hay cut/harvested at various intervals following application of acephate at 1.0 lbs ai/application with the 75% SC formulation.

No. of applications	PHI	ppm of acephate found
1	14	12, 26, 7.4, 6.8, 19, 12, 11.33, 0.46, 11.31, 0.55, 3.15, 1.54, 4.85, 3.98, 11.09, 4.49, 3.01, 0.94,

No. of applications	PHI	ppm of acephate found
1	16	0.57, 0.49, 12, 7.9,
2	14	7.8, 2.79, 4.99, 4.70, 0.24
Anticipated Residue = 6.7		

Methamidophos

Table 15. Residues of methamidophos in/on mint hay cut/harvested at various intervals following different treatment programs with the 75% SC formulation.

No. of applications	PHI	
1	14	0.18, 0.29, 0.25, 0.34, 0.27, 0.31
2	14	0.75, 0.98, 1.0, 1.1, 0.55, 0.54, 0.33, 0.34
Anticipated Residue = 0.5		

Peanuts

Blended

There are several acephate products registered for use on peanuts. These formulations may be applied preplant, at-planting, and postemergence(foliarly) at up to 1.0 lbs ai/A/application. No maximum seasonal rate is specified on the label. The registrant in a use closure memo dated 12/23/97 stated its intentions to modify the labels to specify a maximum seasonal rate of 4 lb ai/A/crop cycle. A PHI of 14 days is established. The feeding of treated forage and hay to livestock, and the grazing of animals on treated areas are prohibited.

Adequate residue data were submitted in support of uses of acephate on peanuts. These data were reviewed by HED in a memo dated 4/7/98 (F. Fort) and were summarized in the dietary exposure assessment review dated 1/28/89 (F.Suhre). No detectable residues were found in 192 samples of peanut nutmeat (LOD = <0.02 ppm); therefore, 0.01 ppm (1/2LOD) incorporating a percent crop treated of 10% will be used as the anticipated residue for peanut nutmeat (0.001 ppm).

Since data have shown that residues do not concentrate in processed peanut commodities, the anticipated residues of 0.001 ppm should be used for peanut meal and oil and a processing factor applied (0.13).

Peppers - Methamidophos only

Although sufficient FDA monitoring data are available for peppers, use of these data will significantly overestimate the risk because these data incorporate methamidophos residues from application of acephate and methamidophos. Additionally, peppers (except canned, frozen and cured) which are considered to be not blended, would be further exaggerated when the decomposition method is used. Because of these reasons, field trial data were used in the assessment for methamidophos for all peppers.

Use patterns registered to Valent: The 75% SC formulations (EPA Reg. Nos. 59639-26 and 59639-89) are registered for multiple foliar applications to bell and non-bell peppers at 1.0 lb ai/A/application and 0.5 lbs ai/A/application, respectively, using ground or aerial equipment. The established PHI is 7 days. No

maximum seasonal rate is specified for bell peppers; however, a 3.5 lb ai/A is established for non-bell peppers. The registrant has stated its intention to modify their labels to specify a maximum seasonal application rate of 1.0 lbs/A and 2.0 lbs/A for non-bell and bell peppers, respectively. No data are available reflecting the proposed use pattern.

Table 16. Residues of methamidophos in/on bell peppers harvested at a posttreatment interval of days following the last of multiple foliar applications of a 75% SC/S formulation at 1.0 lb ai/A/application.

No. of Applications	PHI(days)	ppm of methamidophos found	RDF
7	7	0.22 0.25 0.30 0.32 0.52 0.51	48%CT Totalz = 9 0.22 0.25 0.15 0.17 0.30
6	7	0.15 0.17	0.32 0.52 0.51

Table 17. Residues of methamidophos in/on non-bell peppers harvested at a posttreatment interval of days following the last of multiple foliar applications of a 75% SC/S formulation at 1.0 lb ai/A/application.

Application Rate (lbs ai/A)	PHI(days)	ppm of methamidophos found	RDF
6	7	0.48 0.59 0.35 0.38	48%CT Totalz = 4 0.48 0.59 0.35 0.38

Soybean

Blended

The only current uses of acephate on soybean are Special Local Need registrations, MS970010 and TX970011. These registrations allow Orthene 90 S to be applied aerially or via ground equipment to soybean at a maximum application rate of 1.0 lb. ai/A/application with no specified maximum number of applications. A PHI of 14 days is established. The registrant has committed to change the label to state that no more than 1.5 lbs. ai/A per crop cycle may be applied (see Use Closure Memo, 12/23/97). The label prohibits grazing or cutting vines for hay or forage.

The anticipated residue will be adjusted to incorporate percent crop treated and processing factors for soybean oil, flour, and meal will be applied.

Acephate

Table 18

No. Of Applications	PHI	ppm of Acephate found
3	14	<0.02, 0.03, 0.08, 0.20, 0.05, 0.05, <0.02, <0.02, <0.02, 0.04, <0.02, 0.04, <0.02, <0.02, <0.02, <0.02, <0.02, 0.15, 0.18, <0.02, <0.02, <0.02, <0.02, 0.10, <0.02, <0.02, <0.02
3	15	0.03, <0.02
3	16	0.15, 0.20, 0.15, 0.20
Anticipated Residue = 0.055		

Methamidophos

Table 19

No. Of Applications	PHI	ppm of Methamidophos found
3	14	<0.01, <0.01, <0.01, 0.01, <0.01, <0.01, 0.03, 0.02
3	15	<0.01, <0.01
3	16	<0.01, <0.01
Anticipated Residue = 0.008		

Milk Meat, Poultry and Eggs

Exposure to acephate through meat, poultry and eggs were determined by calculating the dietary burden and multiplying it by the tissue to feed ratio from the appropriate feeding study. The acute anticipated residue for acephate in meat, poultry and eggs is as follows.

Dietary Burden

Meat

	<u>AR</u>	<u>% in Diet</u>	<u>%dry matter</u>	<u>Feed Item Contribution</u>
soybean seed	0.00055	15%	89%	0.00009
soybean meal	0.00030	15%	92%	0.00005

cotton meal	0.013	15%	89%	0.00220
soybean hull	0.00030	15%	90%	<u>0.00005</u>
				0.00239

Poultry

	<u>AR</u>	<u>% in Diet</u>	<u>Feed Item Contribution</u>
soybean seed	0.00055	20%	0.00011
soybean meal	0.00030	40%	0.00012
cotton meal	0.013	20%	0.00260
soybean hull	0.0003	20%	<u>0.00006</u>
			0.00289

Tissue to feed ratios were provided by the registrant and were calculated from results of cattle and poultry feeding studies (Acc. No. 15225, 15226, 15229). Ratios were calculated by dividing the residues detected in the tissues by the amount of acephate fed. Ruminant anticipated residues will be applied to all meat and meat byproducts. Since the dietary burden was calculated using feed items that are considered blended, a point estimate will be used in the acute assessment.

Table 20

Tissue	Maximum Ratio	Acute Anticipated Residue
Ruminant muscle	0.01	0.000023
Ruminant fat	0.0067	0.000016
Ruminant liver	0.0027	0.000006
Ruminant kidney	0.021	0.000050
Poultry Muscle	0.004	0.000012
Poultry Fat	0.00033	0.000001
Poultry liver	0.00033	0.000001
Poultry kidney	0.000083	0.0000002
Egg	0.009	0.000026

Milk

In 1997, PDP tested 727 samples of milk for acephate residues. No detectable residues were found in milk in this sampling period, therefore, residues were estimated at ½ of the PDP testing LOD ($1/2\text{LOD} = 1/2 * 0.001 = 0.0005$ ppm). Since milk is considered to be partially blended, an adjustment to include zeroes to correct for a maximum percent crop treated will be included.

Processing, Washing, Canning, and Cooking Factors

The registrant submitted information (MRID No. 447746-02) for processed, washed, cooked, and/or canned food forms. Acephate processing studies for beans, cauliflower, cotton, cranberries, mint, peanuts and soybeans were used to determine the impact of processing on residues. From these data, processing factors were calculated and applied against the residue levels in the field trial RAC. Processing factors are calculated as the ratio of the residue in the processed food to those in the RAC. These factors were applied against the residue levels. Processing factors are summarized in Table 9 below. Processing studied for washed, cooked, and canned succulent beans and frozen cauliflower also were also available. The factors calculated for these studies will be applied against the residue levels in succulent beans, Brussels sprouts, peppers, and cauliflower. Because PDP samples are washed before being analyzed, washing factors will not be applied when PDP data are used.

Methamidophos washing, cooking and canning factors were obtained from a study submitted by Bayer Corporation (MRID No. 448154-10). The cottonseed processing factors were discussed in the methamidophos anticipated residue memorandum (C. Olinger, 8/99)

Table 21. Acephate Washing, Cooking and Canning Factors

Processed Commodity	Processing Factor
Beans, washed	0.82
Beans, cooked	0.5
Beans, Canned	0.19
Cauliflower, processed and frozen	0.72
Cotton, Refined oil	0.20
Cotton, Meal	1.41
Cotton, Hulls	1.68
Cranberry, juice	0.31
Mint oil	0.07
Peanut, meal	0.13
Peanut, oil	0.13
Soybean, Hulls	0.54
Soybean, Meal	0.54
Soybean, Refined Oil	0.007
Soybean, Flour	0.38

Table 22. Methamidophos Washing, Cooking and Canning Factors

Processed Commodity	Processing Factor
Washing factor, generic	0.77
Peach, washing	0.6
Broccoli, washing	0.77
Broccoli, washing	0.89
Cucumber, washing	0.75
Beans, cooking	0.638
Beans, canning	0.697
Cauliflower, cooking	0.535
Cottonseed meal- processing	1.0
Cottonseed oil - processing	1.0
Peppers - cooking (from okra cooking study)	0.595

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
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